

INTRODUCTION



TAKE ACTION: RECYCLE USED MOTOR OIL

The "Take Action: Recycle Used Motor Oil Tool Kit" is designed for teachers to introduce used motor oil recycling into the classroom.

The tool kit is part of "Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement" ("Action"), which is the centerpiece environmental education program offered by the S.C. Department of Health and Environmental Control's (DHEC)

Office of Solid Waste Reduction and Recycling (Office). For schools and teachers who have received funding through the Office's Recycling Education Grant Program, any of the activities or lessons provided in this tool kit can be used to meet the used motor oil awareness requirement of the grant program.

The Recycling Education Grant Program provides funding for public and private schools in South Carolina. The goal of the program is to promote waste reduction and recycling including setting up or expanding recycling programs. For more information, visit www.scdhec.gov/environment/lwm/recycle/grants.htm.

The "Take Action: Recycle Used Motor Oil Tool Kit" provides hands-on lessons, lesson resources (fact sheets for teachers that present more detailed background on the issues discussed in the lessons), student activity pages and a glossary.

Lessons and activities focus on the basics of used motor oil recycling including the who, what, why and where as well as what happens to used motor oil after it is collected. Much of the information is South Carolina specific providing teachers and students with helpful information and an understanding of the recycling basics not only in the state, but in their community as well.

The lessons are general in design. As always, teachers need to adjust and adapt based on various factors including classroom time available and grade level. One of the lessons, "Oil and Water," is taken from "Action" and is correlated to the S.C. Science Standards.

"Action" and the "Take Action: Recycle Used Motor Oil Tool Kit" as well as other programs are provided at no cost to schools and teachers. For more information, please contact the Office at 1-800-768-7348 or visit www.scdhec.gov/recycle.

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Other Ideas to Consider ...

In addition to the lessons and activities in this tool kit, a variety of other ideas can be used to promote used motor oil recycling. Here are some other assignments students have been given:

- 💧 participating in poster and essay contests;
- 💧 conducting science fair projects;
- 💧 writing and performing plays or skits;
- 💧 developing board and video games; and
- 💧 making PowerPoint presentations and videos.

INTRODUCTION



TOOL KIT REVIEW PANEL

The S.C. Department of Health and Environmental Control's Office of Solid Waste Reduction and Recycling would like to thank the teachers and others throughout South Carolina who participated in the development and review of this tool kit. Individuals listed below gave their time, ideas and experience to ensure that this tool kit will be useful in the classroom.

| | |
|------------------------------|-------------------------------------|
| Heather Barton | Union County Elementary School |
| Debbie Blackmon | S.C. Department of Juvenile Justice |
| Kimberly J. Carter | Mid-Carolina Middle School |
| Meredith M. J. Davakos | Goose Creek Primary School |
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| David Small | North Myrtle Beach High School |
| Gracie White | Hyatt Park Elementary School |
| Alysen Woodruff | City of Greenville |
| Martha Young | North Myrtle Beach High School |

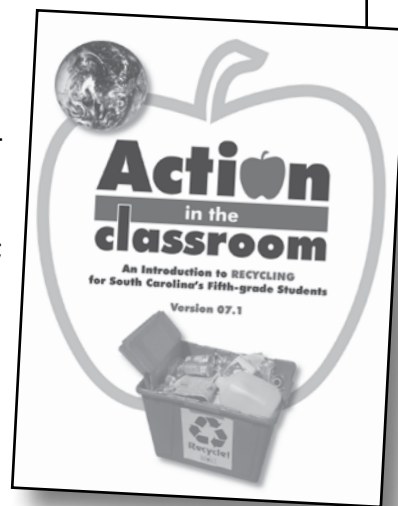
NOTE: The state agencies, municipalities and schools listed indicate where participants were working during the development of this tool kit.

It's time to take 'Action' ...

DHEC has several environmental education programs specifically designed for S.C. teachers and classrooms. They include:

- ◆ "Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement" for kindergarten through 12th-grade teachers;
- ◆ "Action in the classroom" for fifth-grade teachers and students;
- ◆ "Action in the classroom" for seventh-grade teachers and students; and
- ◆ The Green Driver Project for high school driver education students.

Visit www.scdhec.gov/recycle or call 1-800-768-7348 for more information.



LESSON



WHY RECYCLE USED MOTOR OIL?

Learning Objectives

Students will:

- name ways that recycling used motor oil helps protect human health and the environment, saves energy and reduces dependence on foreign oil; and
- recall what happens to used motor oil that is collected for recycling.

Background

In South Carolina, used motor oil must be recycled. It is the law.

If you have your motor oil changed at a car dealership, quick lube or garage, it is recycled by that business. If you are a do-it-yourselfer (DIYer) who changes the oil in your car and truck, you must recycle it. There are more than 800 collection sites throughout the state that accept used motor oil for recycling from DIYers. Local governments offer the majority of the collection sites, but retail outlets such as Advance Auto Parts and Auto Zone also collect used motor oil from DIYers.

Recycling used motor oil helps protect human health and the environment. Used motor oil is insoluble and contains heavy metals that can contaminate water supplies, harm ecosystems and threaten people's health. One gallon of used motor oil improperly disposed of can pollute 1 million gallons of drinking water – enough to supply 50 people for a year. One pint of improperly disposed of used motor oil can produce a 1-acre slick on the surface of a body of water. Given that, never throw used oil in the trash, dump it on the ground or into a lake, river, sewer, septic tank or storm drain.

Recycling used motor oil also can save energy. A primary use of used motor oil is to re-refine it into a base stock for lubricating oil according to the American Petroleum Institute. The process is very similar to refining crude oil. The result is that the re-refined oil is as high quality as oil made from crude oil. Re-refining used motor oil takes 50 to 85 percent less energy than refining crude oil. It also takes 42 gallons of crude oil, but only 1 gallon of used motor oil to produce 2.5 quarts of new lubricating oil.

Recycling used motor oil can create energy. Large industrial boilers can burn used motor oil with minimal pollution. As a result, some used motor oil is used for fuel by power plants and cement kilns.

Some used motor oil is burned in specially designed heaters to provide heat for small businesses or in fleet maintenance shops (e.g., bus garage). In South Carolina, Santee Cooper, the state-owned electric utility, collects used motor oil from local government collection sites as well as industries, businesses and farms across the state. All of the used motor oil collected by Santee Cooper is burned for energy recovery to generate electricity at the Jeffries or Winyah generating stations. Used motor oil has one-third more energy-producing potential than coal. In fact, 1 gallon of used motor oil generates as much power as about 15 pounds of coal according to the electric utility.

Santee Cooper estimates that it has collected more than 20 million gallons of used motor oil since 1990 – enough to provide electricity for more than 1.9 million homes for one month. One gallon of used motor oil can provide enough energy for an average home for 12 hours, pop 117 packs of microwave popcorn, blow dry your hair 108 times, vacuum your house for seven months or run your television for 90 hours.

For information about used motor oil recycling in your community, call the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling (Office) at 1-800-768-7348 or visit www.scdhec.gov/environment/lwm/recycle/counties.htm.

Learning Procedure

1. Discuss with the class why it is important to recycle used motor oil and what happens to the majority of the used motor oil recycled in South Carolina. Stress the amount of energy that one gallon of used motor oil can create.
2. Divide the class into groups of about five students each. Have students determine (or ask the students to ask their parents) how much used motor oil is recycled from each of their homes (include all vehicles, lawnmowers and other similar equipment). For vehicles, assume an average of four oil changes per year and five quarts of oil per change. Calculate the energy that may be created (e.g., 1 gallon of used motor oil can run an average home for 12 hours) from the total amount of used oil recycled from their group and the state. Calculate the amount of coal that is saved by the oil recycled from their group and the state.
3. Have students determine the amount of motor oil

used in the district bus fleet and the amount recycled. Calculate the energy that may be created from the total amount of used motor oil recycled (follow the formula in Learning Procedure No. 2).

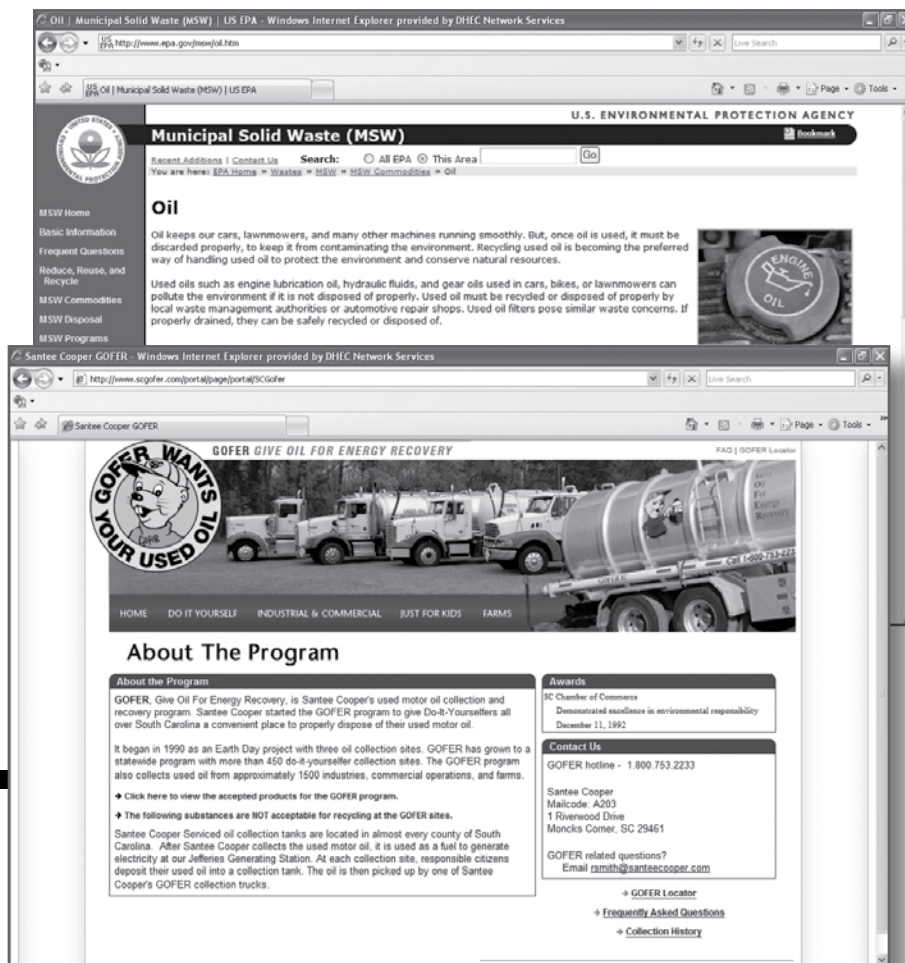
4. Have students survey their family, neighbors and others to determine the number of households that change their own motor oil or have it done outside the home. Students can create a class graph showing the results.
5. Contact your local recycling coordinator and ask for a presentation on used motor oil recycling or a tour of a used motor oil collection site. For a county-by-county listing

of recycling coordinators and programs, visit www.scdhec.gov/environment/lwm/recycle/counties.htm.

6. Contact Santee Cooper and ask for a presentation on the GOFER Program.

For More Information

- ◆ DHEC – www.scdhec.gov/environment/lwm/recycle/oil_recycling.htm
- ◆ U.S. Environmental Protection Agency – www.epa.gov/msw/oil.htm
- ◆ Santee Cooper's Give Oil for Energy Recovery Program – www.scgofer.com
- ◆ American Petroleum Institute – www.recycleoil.org



Pictured are the EPA and Santee Cooper used motor oil recycling Web sites. See the Lesson Resources for their Web addresses.

LESSON



WHERE CAN USED MOTOR OIL BE RECYCLED?

Learning Objectives

Students will:

- ◆ recall that used motor oil is a natural resource that must be recycled;
- ◆ recall that South Carolina has a comprehensive statewide program to collect used motor oil from do-it-yourself oil changers (DIYers); and
- ◆ locate used motor oil collection sites in their community.

Background

Thousands of South Carolinians are DIYers who change the motor oil in their car or truck at home. If you have your motor oil changed by a quick lube, garage or dealership, it is recycled by that business. If you change your own motor oil, you must recycle it.

Why? Used motor oil is insoluble and contains heavy metals that can contaminate water supplies, harm ecosystems and threaten people's health. One gallon of used motor oil improperly disposed of can pollute 1 million gallons of drinking water – enough to supply 50 people for a year. One pint of improperly disposed of used motor oil can produce a 1-acre slick on the surface of a body of water. Given that, never throw used oil in the trash, dump it on the ground or into a lake, river, sewer, septic tank or storm drain. Most of us probably think that spills from oil tankers are the No.1 source of oil improperly

dumped into the environment. That's not the case. The largest single source of oil pollution harming the nation's waters is from DIYers according to the U.S. Environmental Protection Agency (EPA). About 200 million gallons of used motor oil are improperly disposed of each year according to the EPA.

In South Carolina, recycling used motor oil is easy and convenient. The state has one of the best and most comprehensive programs targeting DIYers with more than 800 collection sites that accept used motor oil. Local governments offer the majority of the recycling locations, but retail outlets such as Advance Auto Parts and Auto Zone also collect used motor oil from DIYers. In 2006, DIYers recycled 1,002,006 gallons of used motor oil. This marked the eighth straight year that more than 1 million gallons were collected. Since 1990, more than 13 million gallons of used motor oil were collected from DIYers.

Used motor oil filters and bottles also are collected for recycling from DIYers in most counties. Used motor oil filters, like used motor oil, are banned from disposal at municipal solid waste landfills in the state. Recycling used oil filters is an important part of the overall recycling program because filters can contain from 4 ounces to 1 quart of oil. In addition, filters can easily be recycled.

Used motor oil bottles are important to recycle as well. Bottles can contain as much as 1 ounce of oil that should be recovered before recycling. The plastic bottles can be recycled with other plastic bottles in many local recycling programs.

Recycling motor oil is the law in South Carolina.

The S.C. Solid Waste Policy and Management Act of 1991 (Act) bans the disposal of motor oil in municipal solid waste (MSW) landfills. The Act prohibits the disposal of oil into sewers, drainage systems, septic tanks, surface water or groundwater and on the ground. The Act also prohibits the use of oil for road oiling, dust control, weed abatement and other uses that have the potential to harm the environment.

For more information on where to recycle used motor oil, filters and bottles visit www.scdhec.gov/environment/lwm/recycle/counties.htm or call DHEC's Office of Solid Waste Reduction and Recycling (Office) at 1-800-768-7348.

Learning Procedure

1. Discuss with the class the importance of recycling used motor oil and that used motor oil, if improperly disposed of, can harm human health and the environment. Emphasize that South Carolina has a comprehensive program

targeting do-it-yourself oil changers (people who change the oil in their car, truck or other equipment at home) and that there are hundreds of recycling locations across the state.

2. Survey the class (or ask students to ask their parents) to determine the number of households that change their own motor oil or have it done outside the home (e.g., car dealership, repair shop, service station or quick lube). Follow up by asking students (or asking students to ask their parents) whether they know what happens to the

used motor oil that is replaced during the oil change. Is it recycled? Where is it recycled?

3. Show the class information on used oil recycling in South Carolina – including where to recycle used motor oil, filters and bottles – that is available at www.scdhec.gov/environment/lwm/recycle/counties.htm. Ask the students to search and find out how many used motor oil collection sites are in their county and where they are located.
4. Mark used motor oil recycling locations on a municipal or county map using pins or flags. Have students determine the nearest location to their homes and to the school. Compare the locations and estimate the distances between.
5. Ask the students to find out how much used motor oil was collected for recycling in their county. The information is available at www.scdhec.gov/environment/lwm/recycle/pubs/section4.pdf.
6. Contact your local government recycling coordinator and ask for a presentation on used motor oil recycling or a tour of an used motor oil collection site. For a county-by-county listing of recycling coordinators and programs, visit www.scdhec.gov/environment/lwm/recycle/counties.htm.

Pictured on the left is the Office's Web page for county and municipal recycling programs. Visit www.scdhec.gov/environment/lwm/recycle/counties.htm to view the page on-line. Simply click on the county on the map for a list of recycling programs, recyclables collected by each program as well as local contact information.



LESSON



OIL RECYCLING: GETTING THE WORD OUT!

Learning Objectives

Students will:

- explain the purpose of education and outreach campaigns;
- recall that education and outreach campaigns are not about selling products, but generally about preventing a behavior, stopping a behavior or encouraging the adoption of a new behavior; and
- create an education and outreach "campaign" to promote recycling of used motor oil, bottles and filters.

Background

It wasn't that long ago that many people across the country, mostly do-it-yourselfers (DIYers) who changed the oil in their own car and truck at home, dumped their used motor oil on the ground, down a storm drain or just about anywhere else that was convenient. In the 1990s, the U.S. Environmental Protection Agency (EPA) estimated that about 1 million gallons of used motor oil was disposed of improperly each year just in South Carolina. This type of disposal often harmed the environment particularly threatening lakes, rivers and streams. Clearly, this behavior had to change.

In 1991, South Carolina, like many other states, passed the S.C. Solid Waste Policy and Management Act that required that motor oil must be recycled. If you have your oil changed at a car dealership or quick

lube, it is recycled by that business. If you change your own motor oil, you must recycle it.

Today, South Carolina has one of the nation's best and most comprehensive programs targeting DIYers. In 2006, DIYers recycled 1,002,006 gallons of used motor oil. That marked the eighth straight year that more than 1 million gallons were collected and recycled. Since 1990, more than 13 million gallons of used motor oil have been collected from DIYers.

While enacting a law to protect human health and the environment from the improper disposal of used motor oil is an important step, it is equally important to ensure that the public is made aware of the law, understands what to do with used motor oil and is motivated to recycle it.

The S.C. Department of Health and Environmental Control's (DHEC) Office of

Solid Waste Reduction and Recycling developed a statewide public awareness campaign to promote used motor oil recycling as well as the recycling of oil filters and bottles. The campaign has been modified over the years, but has included radio and television public service announcements (PSAs) starring the



Pictured above are the "Recycle Guys" from DHEC's Office of Solid Waste Reduction and Recycling.

“Recycle Guys” and later NASCAR drivers Kyle Petty and Jeff Gordon. In addition, the campaign has used billboards, posters, brochures, curriculum materials, a video for high school driver education classes, special events, costumed characters, a toll-free number (1-800-768-7348) and a Web page (www.scdhec.gov/recycle) to spread the word.

The campaign included other partners such as Santee Cooper’s Give Oil For Energy Recovery (GOFER) program and the S.C. Department of Transportation. Visit www.scgofer.org to learn more about the GOFER program.

Learning Procedure

1. Discuss with the class why used motor oil must be

It’s important to recycle used motor oil.

Why? Used motor oil is insoluble and contains heavy metals that can contaminate water supplies, harm ecosystems and threaten people’s health.

One gallon of used motor oil improperly disposed of can pollute 1 million gallons of drinking water – enough to supply 50 people for a year. One pint of improperly disposed of used motor oil can produce a 1-acre slick on the surface of a body of water. Given that, never throw used oil in the trash, dump it on the ground or into a lake, river, sewer, septic tank or storm drain.

recycled in South Carolina and where it can be recycled. Visit www.scdhec.gov/recycle and click on RECYCLING WHERE YOU LIVE for nearby locations.

2. Continue that discussion by emphasizing that education and outreach efforts are essential in making people aware of the importance and benefits of recycling used motor oil, bottles and filters. Explain that a public information campaign is an organized method for getting specific messages across to a specific group of people (a target audience).
3. Explain to students that there are many possible strategies to get the word out about used motor oil recycling. These strategies include: radio and television PSAs; public service interviews (guest appearances on local radio and television programs); advertisements in newspapers and magazines; media releases (written news information that is sent or given to television and radio stations, newspapers and others); brochures; posters; point-of-purchase displays; and billboards. Examples are provided on the following pages.
4. Introduce and define PSAs for students. Explain to the students that successful PSAs must grab the attention of the intended audience and present the key message effectively – that is, to make sure the target audience remembers it. To do this, the PSAs must be appealing or offer an incentive as well as be credible, understood and relevant to the intended audience. To view several television PSAs developed by DHEC’s Office of Solid Waste Reduction and Recycling, visit www.scdhec.gov/recycle and click on PUBLICATIONS AND MATERIALS on the menu of the left-hand side of the page. Then click on PUBLIC SERVICE ANNOUNCEMENTS on the menu.
5. Have students design a poster, brochure or signage to promote used motor oil recycling. Display the posters in your school or have a poster contest and display the winning posters in area businesses.
6. Have students write a 30-second or 60-second PSA that can be read on the school’s news broadcast or announcements.
7. Divide the class in teams of about five students each. The assignment for each team is to develop a television or radio PSA to promote recycling of used motor oil, bottles and filters. Allow one classroom period for students to research, brainstorm and plan their campaign. Give students a deadline

It’s easy to recycle used motor oil.

In South Carolina, recycling used motor oil is easy and convenient. The state has one of the best and most comprehensive programs targeting DIYers with more than 800 collection locations that accept used motor oil. Local governments offer the majority of the recycling locations, but retail outlets such as Advance Auto Parts and Auto Zone also collect used motor oil from DIYers.

for research to supplement the information that was discussed in class.

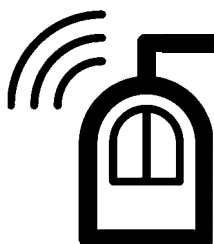
8. Devote a second classroom period to have students perform and explain their PSA. Ask students which PSAs were the most effective and why. Ask students why PSAs are an effective method of educating the public about environmental issues. Ask students to discuss what other methods can be used to get the word out on environmental issues.

Pictured are a poster, brochure and bumper sticker from the EPA's "You dump it, you drink it." campaign.

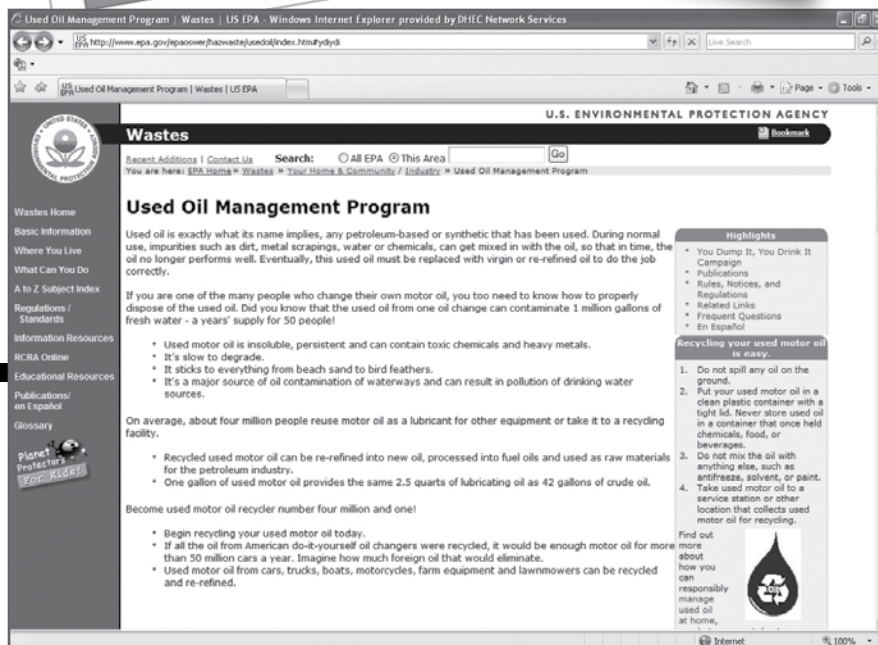
Examples of PSAs

Environmental PSAs can be viewed on the following Web sites.

- www.scdhec.gov/environment/lwm/recycle/resource_center.htm – click on PUBLIC SERVICE ANNOUNCEMENTS and then choose "In the Classroom" and "On the River."
- www.smokeybear.com
- www.energystar.gov
- www.epa.gov (and search for public service announcements)



Pictured is the EPA's Used Oil Management Web Page that includes posters, brochures and other materials to download. Visit the Web page at www.epa.gov/epaoswer/hazwaste/usedoil/index.htm.





MONCK'S CORNER, S.C.—Fifteen years ago this week, Santee Cooper officials poured the gallon on used motor oil into a collection site--and the state-owned utility's Give Oil For Recovery, or GOFER, program began.

GOFER provides do-it-yourself oil changers, who service everything from small lawn mowers, trucks and boats, a convenient and safe way to dispose of a potential pollutant.

Seventeen million gallons and \$73 additional collection sites later, the GOFER program is now the largest used motor oil collection and recycling program. Santee Cooper collects used oil from cars, trucks and boats, a convenient and safe way to dispose of a potentially polluting waste. The oil is then recycled into electric power.

GOFER's 15th anniversary was celebrated in Moncks Corner today, where Santee state officials marked the occasion by brief speeches, recognizing GOFER color winners, ceremoniously pouring a few gallons of oil and an appearance by the GOFER

"GOFER is such a positive environmental story for South Carolina because until it came along, the public had few, if any, real options to properly dispose of used oil," said Carter, the utility's president and chief executive officer. "There is no excuse to dump used oil on the ground or in a body of water. It's also illegal. There are at least four GOFE counties in the state. Thirty-eight counties have at least 10 GOFER sites and more than 60 county recycling centers. GOFER's success is due to the public, which does its part by using this service. Today we thank them for their participation in keeping our environment clean."

The program has been operating since 1978, says Carter. "It's been successful for over

"Santee Cooper provides an invaluable service by picking up the used motor oil, recycling centers throughout the state," said Pat Walker, bureau chief of the Department of Health and Environmental Control's bureau of land and water conservation. "It's a great service to the community and the environment."

**S.C. Used Motor Oil
Recycling Program
for Do-it-Yourselfers:
A SUCCESS!**

- **1,002,006 GALLONS** of used motor oil were collected for recycling in 2006.
- **MORE THAN 13 MILLION GALLONS** of used motor oil have been collected for recycling since 1990.
- **MORE THAN 800 USED MOTOR OIL COLLECTION SITES** are throughout the state.
- **MOST COUNTIES COLLECT USED OIL FILTERS AND OIL BOTTLES** for reuse.

We love to drive. To the supermarket, to the mall, to school, to see friends, to get a pizza, to our job, to the beach or mountains and to a million places in between. We get in the car, buckle up and hit the road every day.

There are many responsibilities related to that privilege. Safety, for example, is a top priority. Slow down. Be careful.

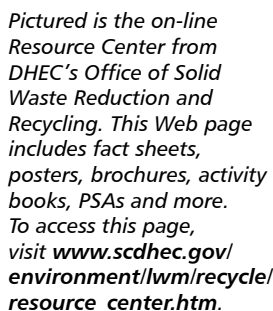
Another responsibility often forgotten is the environmental impact of driving. Cars and trucks, for example, release pollutants into the air. Cars and trucks use energy. And cars and trucks use motor oil. It's a fact of life. It's driven into you the moment you begin to drive: you have to change your oil periodically to maintain your vehicle and ensure that it runs properly. That's a lot of oil. In fact, about 1.1 billion gallons of motor oil are sold annually in the United States according to the American Petroleum Institute (API).

What do you do with your used motor oil after you change it? What happens to it?

Recycling motor oil is the

Recycling motor oil is the law in South Carolina.

That's right. In South Carolina, it's the law. The S.C. Solid Waste Policy and Management Act of 1991 (Act) banned the disposal of motor oil in municipal solid waste (MSW) landfills after May 27, 1992. The Act prohibits the disposal of motor oil in landfills, incinerators, sewage treatment plants, and other facilities that treat, store, or dispose of solid waste, including landfills, incinerators, sewage treatment plants, and other facilities that treat, store, or dispose of solid waste.



DON'T WRECK THE ENVIRONMENT!

TAKE CARE OF THE ENVIRONMENT WHILE TAKING CARE OF YOUR CAR.

Proper maintenance not only helps your car last longer, it also can help maintain a healthy environment. Follow the tips below to improve your car's performance and protect our land, air and water.

- Recycle your used motor oil. It's the law in South Carolina. Keep it out of our lakes and streams.
- Replace oil and air filters frequently. It will keep our air cleaner. Remember, oil bottles and oil filters are recyclable.
- Check the air pressure in your tires. Under-inflated tires cause wear and reduce your gas mileage.
- Rotate your car's tires regularly. This will extend the life of your tires.
- Turn off your car's engine when parked. This will reduce ground-level ozone emissions and save gasoline.
- Refuel your car in the evening. This reduces ozone emissions, too.

RECYCLE YOUR USED MOTOR OIL, OIL BOTTLES AND FILTERS!

The City of Rock Hill is now accepting your used motor oil, oil bottles and filters for recycling! Drop off your used motor oil (free from contaminants), oil bottles and filters at the

City of Rock Hill Operations Center Garage

Door Number 4, 349 Columbia Avenue, 7 a.m. to 3 p.m., Monday through Friday.

If you have any questions, please call 803-329-5610. Receive a FREE oil change pan and funnel when you drop off your oil – while supplies last.



RECYCLE!



For more information about recycling
in the City of Rock Hill, call 803-329-5610 or visit
www.scdhec.gov/environment/lwm/recycle/york.htm.



Pictured are a used motor oil recycling poster for the City of Rock Hill and a billboard for Greenville County created by the Office.

Recycle



GREENVILLE COUNTY
SOLID WASTE DIVISION
RECYCLES

used motor oil, filters & bottles.




For more information, please call **243-9672**
or visit www.greenvillecounty.org/solid_waste/.

This message is provided by the Greenville County Solid Waste Division and the S.C. Department of Health and Environmental Control.

Pictured below is an ad from Santee Cooper promoting used motor oil recycling. On the right is a brochure about used motor oil collection for DIYers and farmers in Lexington County. Also pictured is a motor oil recycling poster featuring NASCAR driver Jeff Gordon.

Powerful Tip #5




Recycle used motor oil.

Take it to a GOFER Oil Recovery Site.
And we'll turn it into electricity.

Find your closest GOFER Oil Recovery Site at
SanteeCooperGreen.com/GOFER

A lot of little things make a big difference.




PROPER USED OIL MANAGEMENT

for Do-It-Yourself & Farmer Oil Changers

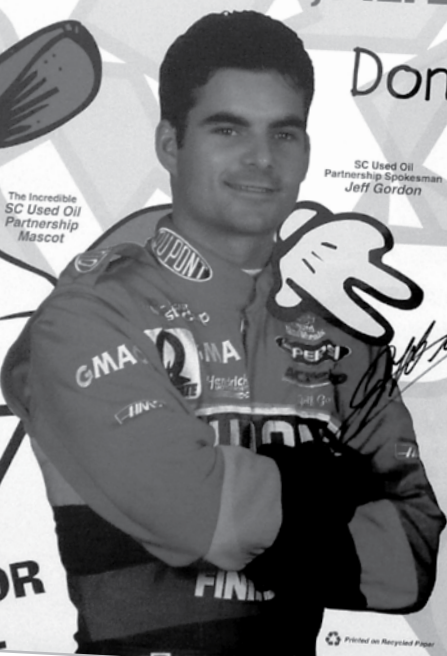


Provided by
**Lexington County
Solid Waste Management**
498 Landfill Lane, Lexington, SC 29073
(803) 755-3325
www.lex-co.com/solidwaste.html

RECYCLE USED OIL, FILTERS & BOTTLES!



The Incredible
SC Used Oil
Partnership
Mascot




SC Used Oil
Partnership Spokesman
Jeff Gordon

Don't POUR

South
Carolina's
Future Down
the Drain!

For more information about recycling, call
1-800-SO-USE-IT



Printed on Recycled Paper

Poster designed by the CHEC Art Graphics for the Bureau of Land and Waste Management. CR-00001 000

LESSON



OIL & WATER: THEY REALLY DON'T MIX.

Learning Objectives

Students will:

- see how oil pollutes water;
- test water samples for oil residue; and
- perform an experiment to determine one part per 10 million.

Background

Have you ever heard the saying “Oil and water don’t mix?” It’s true. Improperly disposed of oil can be a major threat to the environment, particularly our water supplies.

Most of us probably think that spills from oil tankers are the No. 1 source of oil dumped improperly into the environment. That’s not the case. The U.S. Environmental Protection Agency (EPA) estimates that the largest single source of oil pollution harming our nation’s waters is from people who change their own oil – do-it-yourselfers (DIYers). Overall, about 200 million gallons of used oil are disposed of improperly each year – poured down storm drains or the sewer, dumped on the ground or tossed in the trash – according to the EPA.

In South Carolina, used motor oil must be recycled – it’s the law. The S.C. Solid Waste Policy and Management Act of 1991 (Act) prohibits the disposal of used motor oil in municipal solid waste landfills, sewers, drainage systems, septic tanks and surface water. The Act also prohibits using used motor oil on roads as dust control, for weed abatement and other uses that can potentially harm the environment.

Used motor oil must be recycled. If you have your oil changed for you (at a car dealership or quick lube), your used motor oil is recycled by that business. If you are a DIYer, you must recycle the used motor oil.

South Carolina has one of the nation’s best and most comprehensive recycling programs targeting DIYers. What began in the early 1990s to conserve resources and to stop illegal dumping of used motor oil, has grown into a one-stop program that also accepts motor oil bottles, filters and oil/gasoline mixtures from DIYers as well as used motor oil from small farming operations.

The program – primarily funded by DHEC through the Petroleum Fund – has grown to more than 800 collection sites across the state.

The program serves as a model of how convenience and participation go hand in hand. Part of this growth and subsequent success can be attributed to retail outlets, quick lubes and auto parts stores that accept used motor oil from DIYers. The state-owned utility, Santee Cooper, plays a significant role in this statewide collection network through its Give Oil For Energy

Recovery (GOFER) program. All of the used motor oil collected by Santee Cooper is burned for energy recovery to generate electricity at the Jeffries or Winyah generating stations. To learn more visit, www.scgofer.org.

For the eighth consecutive year, more than 1 million gallons of used motor oil was recycled. In calendar year 2006, DIYers recycled 1,002,006 gallons of used motor oil. Since 1990, DIYers in South Carolina have recycled more than 13 million gallons of used motor oil. Used motor oil generated and recycled by DIYers

***This lesson is
correlated to the
S.C. Science Standards.***
See page 16 for details.

is counted as part of the state's municipal solid waste (household garbage) recycling rate.

Just what does happen when oil ends up in water? When oil ends up in water, a film of oil on the surface can block photosynthesis and slow the production of oxygen. The reduced oxygen supply then causes stress to the point of death in aquatic organisms. Large organisms such as mammals and birds are the most familiar victims of oil pollution because of their visibility and emotional appeal to people. Feathers and fur stick together, become matted and lose the ability to insulate animals against cold. Death may result from temperature shock or from swallowing oil as the animals try to clean it from their coats.

Oil in water also can affect other organisms. Some of the components of oil may evaporate into the air or dissolve into the water. Many of them are carcinogens. Some of the oil spilled into an aquatic environment settles to the bottom affecting the organisms living there. Oil can clog breathing structures or be absorbed into tissues and then passed up the food chain, even to humans who eat fish or shellfish. Oil may harm bacteria or plankton, the basis of the food chain.

One gallon of used oil can potentially destroy 1 million gallons of fresh water – enough to supply 50 people with drinking water for an entire year. One pint of oil can produce a slick on water about 1 acre in size and will kill floating aquatic organisms.

It's not just the oil that poses a threat to the environment. As much as 20 percent of automotive oil is composed of substances that are added to

improve performance, inhibit rust or prevent foaming – many of which are toxic. Oil also will pick up sediment and gasoline components and additives from the engine during combustion. High levels of lead – as well as other toxins including benzene, cadmium, zinc, magnesium and polychlorinated biphenyls (PCBs) – may be present in oil and may contaminate the environment if not properly handled.

Used motor oil should never be emptied into sewers or storm drains or dumped directly onto the ground to kill weeds or to suppress dust on dirt roads. Used motor oil should never be thrown into the trash where it will end up in landfills. Improper disposal of used oil is illegal and carries penalties that include jail and fines of up to \$10,000 per day.

Why recycle oil? It is clear that recycling used motor oil protects human health and the environment, but there are other reasons why we should recycle it.

- ◆ Recycling used motor oil also saves valuable energy. Two gallons of used motor oil can generate 36-kilowatt hours of electricity. That's enough to run an average household for a day, cook 36 meals in a microwave, blow dry your hair 216 times, vacuum your house for 15 months or run your television for 180 hours.
- ◆ Recycling used motor oil also helps reduce dependency on foreign oil. Oil is the No. 1 source of energy for the U.S., supplying about 40 percent of the nation's overall energy needs according to the American Petroleum Institute (API). About half of the oil we use is produced in the U.S while the rest is imported.

What happens to collected motor oil? It can be used in a variety of ways. Nationally, about 14 percent of the used motor oil collected nationwide is re-refined for use as a new generation of motor oil or as fuel oils according to the API. About 75 percent is reprocessed for use in asphalt plants, industrial and utility boilers, steel mills and other facilities. About 11 percent is used in specially designed space heaters in automotive bays and municipal garages.

The oil helps these types of facilities reduce their heating costs. This practice, however, is not recommended for home use. Most of the oil collected in South Carolina is burned for energy recovery to generate electricity.

Lesson Materials

If possible, assemble several sets of these materials so that the class can perform the experiment in small groups, otherwise use one set of materials and perform the experiment as a class.

One set of materials includes:

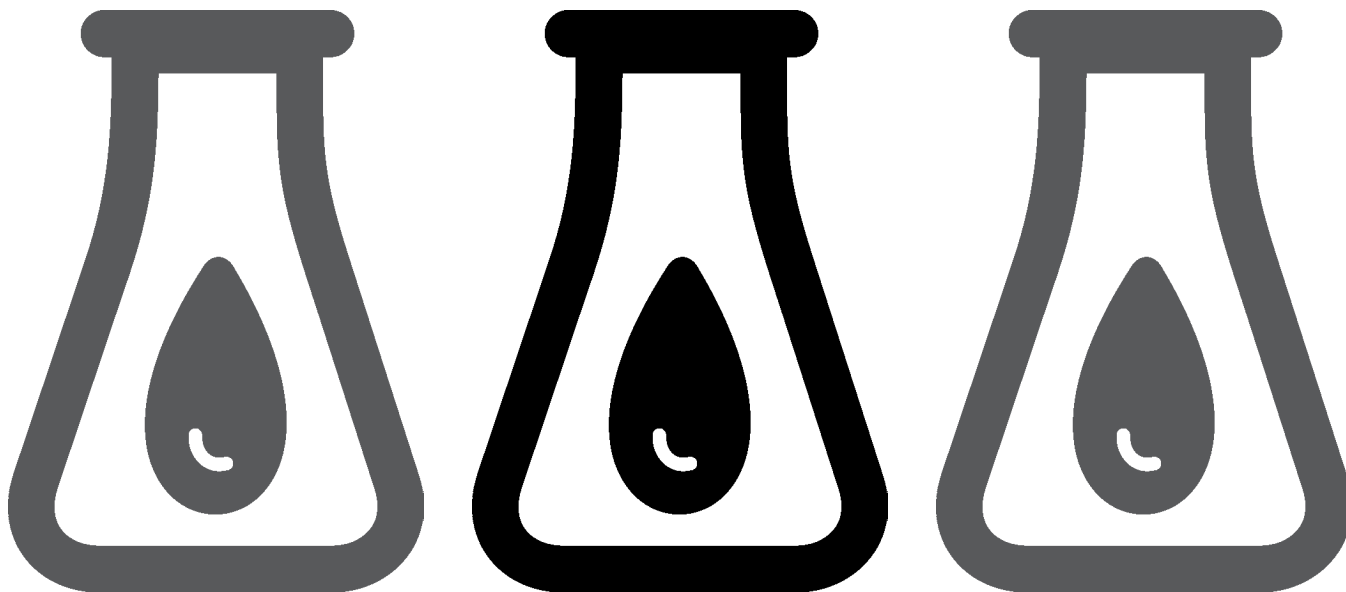
- ◆ seven test tubes;
- ◆ test tube rack;
- ◆ 10 ml graduated cylinder;
- ◆ olive oil;
- ◆ 250 ml beaker;
- ◆ brown paper bag (cut in strips);
- ◆ blue food coloring;
- ◆ wax pencil; and
- ◆ eye dropper (or calibrated straw).

Learning Procedure: Day One

1. Review the background material with the class on the impact improperly disposed of used motor oil has on the environment, especially water.
2. Have students perform the following experiment to demonstrate how small quantities of oil can pollute large amounts of water. Perform the following experiment.
 - A. Add a few drops of blue food coloring to a large bowl of water.
 - B. Measure 100 ml of blue water from your bowl and place it into your 250 ml beaker.
 - C. Add 9 ml of blue water to each test tube in your test tube rack.
 - D. Calibrate the eyedropper to measure 1 ml. This can be done by adding 10 ml of this solution to your cylinder and then drawing out the water, using the eyedropper until the level in the cylinder reaches the 9 ml mark. Use the wax pencil to mark the water level in the dropper.
 - E. Pour out unused water from your cylinder and measure out 1 ml of olive oil. Add this to test tube #1.
 - F. Shake the test tube thoroughly. Quickly, before the oil and water separate, remove 1 ml of this solution with your calibrated dropper and add it to the next test tube (#2).
 - G. Repeat step F until you feel that there is no oil left, checking either visually or by smell. Repeat step F no further than test tube #7. At this point, you will have a dilution of one 10-millionth.
 - H. Check for oil in your solution by dipping a strip of brown paper 5 inches long by 1/2-inch wide into the test tube. If you don't observe the oil immediately, label your strip and set it aside to dry overnight.
 - I. Clean the lab area and materials. Use warm water and soap to remove all traces of oil in all the test tubes.

Learning Procedure: Day Two

1. Check the brown paper strips for oil spots.
2. Have students answer the "Questions for the Class" individually or as a group.



Questions for the Class

1. Did you find oil spots on the brown paper strips the next day? (Yes)
2. Where do you think this oil would go in nature? (It may end up in lakes, rivers and groundwater. It may be swallowed by fish, animals and by people.)
3. What are some of the contaminants found in used oil? (Used oil contaminants include heavy metals such as lead, cadmium, zinc, barium, chemical additives, dirt, iron and steel particles.)
4. Did the water dilute the oil completely? (No)
5. List items you or your family own that use motor oil and have the capability of contaminating the environment. (This list may include lawn mowers, cars, boats, gasoline-powered tools such as chain saws, string trimmers and leaf blowers.)
6. What can you do with used motor oil to prevent it from becoming a source of pollution? (Take it

to a used oil collection site. Visit www.scdhec.gov/recycle and click on RECYCLING WHERE YOU LIVE or call 1-800-768-7348 for the location nearest you.)

Extension Activities

1. Have students prepare posters promoting used motor oil recycling and how to collect used motor oil for recycling. Ask local service stations and automotive parts stores to display them.
2. Have students investigate what your school district does with used motor oil, used motor oil filters and motor oil bottles from school buses and other maintenance equipment. Have students calculate how much used oil your school district must handle during the school year. (Calculate how many vehicles X how much oil per oil change X how many oil changes per year.)
3. Have students research and prepare reports on how used motor oil is used for energy recovery in South Carolina.

Correlations to the S.C. Science Standards for this Lesson

6-3 Students will demonstrate an understanding of structures, processes, and responses of animals that allow them to survive and reproduce. (Life Science)

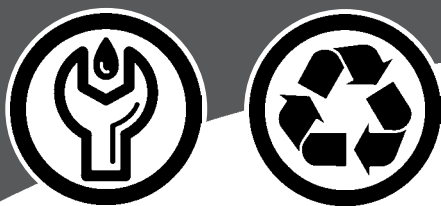
■ Oil and Water

7-4.5 Summarize how the location and movement of water on Earth's surface through groundwater zones and surface-water drainage basins, called watersheds, are important to ecosystems and to human activities.

Taxonomy Level: 2.4-B Understand Conceptual Knowledge

■ Oil and Water

LESSON RESOURCE



USED MOTOR OIL RECYCLING

We love to drive. To the supermarket, to the mall, to school, to see friends, to get a pizza, to our job, to the beach or mountains and to a million places in between. We get in the car, buckle up and hit the road every day.

There are many responsibilities related to that privilege. Safety, for example. Buckle up. Slow down. Be careful.

Another responsibility often forgotten is the environmental impact of driving. Cars and trucks, for example, release pollutants into the air. Cars and trucks use energy. And cars and trucks use motor oil. It's a fact of life. It's driven into you the moment you begin to drive: you have to change your oil periodically to maintain your vehicle and ensure that it runs properly. That's a lot of oil. In fact, about 1.1 billion gallons of motor oil are sold annually in the United States according to the American Petroleum Institute (API).

What do you do with your used motor oil after you change it? What can you do with it? What happens to it?

Recycling motor oil is the law in South Carolina.

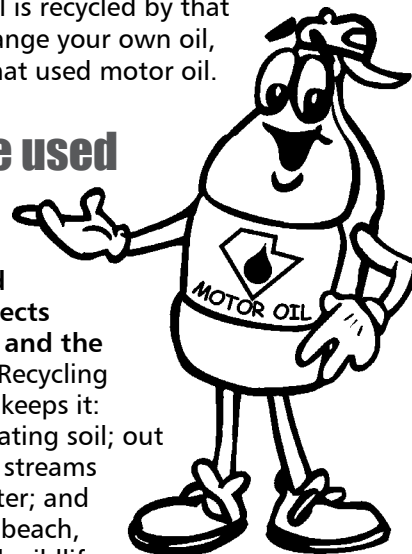
That's right. **In South Carolina, it's the law.** The S.C. Solid Waste Policy and Management Act of 1991 (Act) banned the disposal of motor oil in municipal solid waste (MSW) landfills after May 27, 1992. The Act prohibits the disposal of oil into sewers, drainage systems, septic tanks, surface water or groundwater and on the ground. The Act also prohibits the use of oil for road oiling, dust control, weed abatement and other uses that have the potential to harm the environment.



It must be recycled. If you have your oil changed for you (at a car dealership, garage or quick lube), your used motor oil is recycled by that business. If you change your own oil, you must recycle that used motor oil.

Why recycle used motor oil?

- ◆ **Recycling used motor oil protects human health and the environment.** Recycling used motor oil keeps it: from contaminating soil; out of rivers, lakes, streams and groundwater; and away from the beach, aquatic life and wildlife. The potential harm that improperly disposed of used oil may cause is staggering. One gallon of used motor oil improperly disposed of may contaminate 1 million gallons of fresh water – enough to supply 50 people with drinking water for one year. One pint of used motor oil improperly disposed of can create a one-acre slick on the surface of a body of water and kill floating aquatic organisms.
- ◆ **Recycling used motor oil also saves valuable energy.** Two gallons of used motor oil can generate 36-kilowatt hours of electricity. That's enough to run an average household for a day, cook 36 meals in a microwave, blow dry your hair 216 times, vacuum your house for 15 months or run your TV for 180 hours.
- ◆ **Recycling used motor oil also helps to reduce dependency on foreign oil.** Oil is the No. 1 source of energy for the U.S., supplying about 40 percent of the nation's overall energy needs according to the API. About half of the oil we consume is produced here in the U.S while the rest is imported.



What happens to recycled motor oil?

Recycled motor oil can be used in a variety of ways. Most is processed for use in asphalt plants, industrial and utility boilers, steel mills and other facilities. Some is re-refined for use as a new generation of motor oil or as fuel oils. The rest is used in specially designed space heaters in automotive bays and municipal

garages. The oil helps these types of facilities reduce their heating costs. This practice, however, is not recommended for home use.

Most of the oil collected from DIYers in South Carolina is burned for energy recovery to generate electricity by Santee Cooper, the state-owned utility. Santee Cooper estimates that it has collected more than 20 million gallons of used motor since 1990 (collected from DIYers and businesses) – enough to provide electricity for more than 1,925,000 average homes for 1 month.

In fact, it is estimated that about 185 million gallons of used motor oil are improperly disposed each year – poured in storm drains or the sewer, dumped on the ground and tossed in the trash.

The good news – no, great news – in South Carolina is that the state has developed one of the nation's best and most comprehensive programs targeting DIYers. A used oil recycling program for DIYers began in South Carolina in 1990 when Santee Cooper collected nearly 3,000 gallons of used oil from eight locations. In 1991, Santee Cooper expanded the Give Oil for Energy Recovery (GOFER) program throughout the state. Following the passage of the Act, the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling (Office) began providing grant funding and technical assistance to local governments to set up used motor oil recycling centers. The combined efforts have resulted in one of the nation's top overall programs.

S.C. Used Motor Oil Recycling Program for DIYers is a SUCCESS!

- 1,002,006 GALLONS of used motor oil were collected for recycling in 2006.
- MORE THAN 13 MILLION GALLONS of used motor oil have been collected for recycling since 1990.
- MORE THAN 800 USED MOTOR OIL COLLECTION SITES are throughout the state.
- MOST COUNTIES COLLECT USED OIL FILTERS AND OIL BOTTLES for recycling in addition to used motor oil.
- 73 OIL/GASOLINE MIXTURE COLLECTION TANKS have been established in 40 counties.
- 55 FARMER OIL COLLECTION TANKS have been established in 40 counties.

South Carolina has a slick program targeting DIYers.

API estimates that more than 50 percent of all motorists are DIYers. The U.S. Environmental Protection Agency (U.S. EPA) estimates that the largest single source of oil pollution harming our nation's waters is from DIYers.



Pictured above is a used motor oil collection site in Pickens County. In addition to motor oil, this site also accepts oil filters, oil bottles and cooking oil. Note the motor oil bottle drain rack in the background.

Take Action: Recycle Used Motor Oil Tool Kit

In calendar year 2006, DIYers in South Carolina recycled 1,002,006 gallons of used motor oil at more than 800 collection sites throughout the state. This marks the eighth consecutive year that more than 1 million gallons were collected. Since 1990, more than 13 million gallons of used motor oil have been collected from DIYers.

Used motor oil filters and bottles also are collected from DIYers in most counties. Used motor oil filters are banned from MSW landfills unless "hot drained" or crushed to their smallest practical volume. The used motor oil filter recycling program began in 1994 with just three counties collecting filters. This is an important part of the overall recycling program because filters can contain from 4 ounces to 1 quart of oil. Most of the filters recycled in South Carolina are sent to several steel mills located in the state and made into new steel products.

South Carolina became one of the first states to collect used motor oil bottles, beginning a program in 1995 with two counties. Bottles are an important target for recycling for two reasons. First, oil bottles are made from a plastic that is recyclable in most local

programs. Second, each bottle can contain as much as one ounce of oil that should be recovered before recycling. In addition the program offers recycling locations for farmers and for oil/gasoline mixtures.

For more information about the recycling of used motor oil, filters or bottles in South Carolina including the nearest collection site, please call the Office at **1-800-768-7348** or visit **www.scdhec.gov/recycle**.

Recycle your antifreeze, batteries and tires, too.

There's more to recycle than your used motor oil, filters and bottles. DIYers also should recycle antifreeze, batteries and

tires. Handled or disposed of improperly, they can pose a risk to your health and the environment.

Antifreeze is accepted in many recycling programs throughout the state. Check with your local recycling coordinator to see if it is accepted in your community. If not, your best option may be to check with your car dealer or mechanic to see if they will accept your antifreeze.

Lead-acid batteries (e.g., car and truck batteries) must be recycled in South Carolina. You can recycle your old battery at the retail location where you buy your new battery. There is a \$7 fee added to the cost of the battery to ensure that it is recycled. If you return your old battery when you buy a



Used Motor Oil Recycling Fact

Local governments run the majority of the more than 800 used motor oil collection sites in South Carolina. Retail stores – including Advance Auto Parts and Auto Zone stores – also collect used motor oil from DIYers.

Did you know?

There were about 203 million licensed drivers in the United States who drove on average almost 15,000 miles in 2006 according to the U.S. Department of Transportation.

Green Driver Project: Be a ROADS Scholar

This project, offered by the Office, targets high school driver education classes on the environmental impact of driving, including used motor oil recycling, energy conservation, litter prevention as well as air and water protection. Call 1-800-768-7348 for more information.



new battery, you will receive a \$5 credit and only be charged \$2.

Tires must be recycled in South Carolina. There is a \$2 fee on each new tire sold in the state with a U.S. Department of Transportation number. The fee is used to ensure that your old tires are recycled. You can recycle your old tires at the retail location where you buy your new tires. In addition, all counties have collection programs that accept waste tires (usually about five) at drop-off recycling centers or other locations.

For more information about recycling antifreeze, batteries and tires in your community, visit www.scdhec.gov/environment/lwm/recycle/counties.htm or call the Office at 1-800-768-7348.

Recycle more than used motor oil ...

The following petroleum products are acceptable in used motor oil collection tanks: power steering, transmission and hydraulic fluid; gear, fuel and heating oil; diesel fuel; and kerosene.

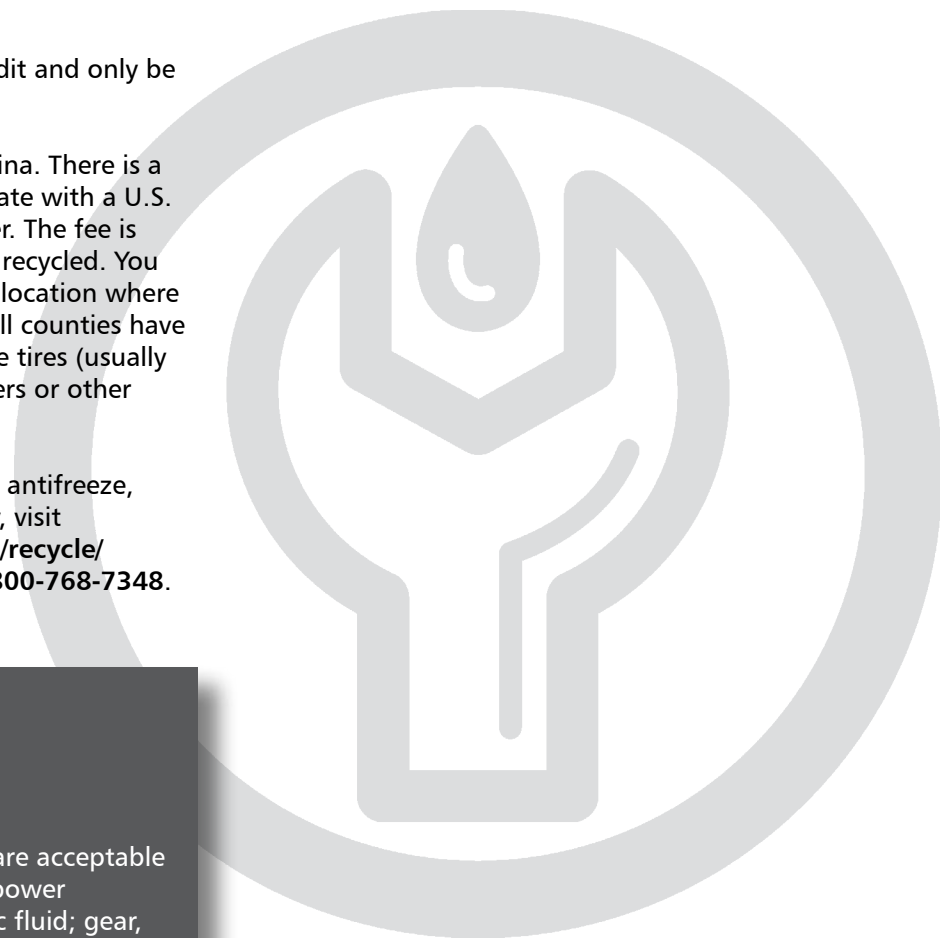
These products can be mixed with your used motor oil or taken to the collection sites in separate containers.

... but don't mix it.

Never mix antifreeze, brake fluid, gasoline, paint thinner, refrigeration oil, water or any solvents with your used motor oil. Once contaminated with these products, the used motor oil cannot be recycled.

Many counties offer separate collection sites for used motor oil/gasoline mixtures.

For a site near you, visit www.scdhec.gov/environment/lwm/recycle/counties.htm or call the Office at 1-800-768-7348.



LESSON RESOURCE



CHANGING YOUR OWN USED MOTOR OIL?

You know what to do. You roll up your sleeves, crawl under the car and get it done. You're one of the millions of do-it-yourselfers (DIYers) across the country that changes your own motor oil.

Do you recycle it? In South Carolina, used motor oil must be recycled. It's the law. If you have your oil changed at a car dealership or quick lube, it is recycled by that business. If you change your own motor oil, you must recycle it.

Never throw used oil in the trash, dump it on the ground or into a lake, river, sewer, septic tank or storm drain. Used motor oil is insoluble and contains heavy metals that can contaminate water supplies and harm ecosystems. It doesn't take much to do a lot of damage. One gallon of used motor oil disposed of improperly can pollute 1 million gallons of drinking water – enough to supply 50 people for a year. One pint can produce an oil slick the size of a football field.

Used motor oil has value. It doesn't wear out, it just gets dirty. The used motor oil you take to a collection site can be recycled into new products, burned for heat or used to generate electricity. In South Carolina, recycling used motor oil is easy and convenient. The state has one of the nation's best and most comprehensive programs targeting DIYers with more than 800 recycling locations that accept used motor oil. Local governments offer the majority of the recycling locations, but retail outlets such as Advance Auto Parts and Auto Zone also collect used motor oil from DIYers.

Used motor oil filters and bottles also are collected for recycling from DIYers in most counties. Used motor oil filters, like used motor oil, are banned from

disposal at municipal solid waste landfills in the state. Recycling used oil filters is important because filters can contain from 4 ounces to 1 quart of oil. In addition, filters can easily be recycled. Used motor oil bottles are important to recycle as well. Bottles

can contain as much as 1 ounce of oil that should be recovered for recycling. The plastic bottles can be recycled with other plastic bottles in many local recycling programs.



For more information on where to recycle used motor oil, filters and bottles visit www.scdhec.gov/environment/lwm/recycle/counties.htm or call the S.C. Department of Health and Environmental Control's Office of Solid Waste Reduction and Recycling (Office) at 1-800-768-7348.

For more on South Carolina's used motor oil recycling program, see the Lesson Resource "Used Motor Oil Recycling" on page 17.

Do it yourself? Do it right.

If you change the motor oil in your car, truck, motorcycle, boat, recreational vehicle or lawn mower, be certain to work carefully and recycle the used motor oil, filters and bottles properly. Follow these steps for a clean oil change that prevents pollution and conserves energy for a safer and healthier tomorrow.

♦ STEP 1: Drain the oil.

- o Drain the used motor oil from the engine's crankcase into a pan. Make sure you have a large enough pan to hold the volume of

oil from the engine's crankcase. Many DIYers use a drain pan that serves as both a collection and holding container.

- o Drain the used motor oil when the engine is warm to ensure that any sludge flows out smoothly. Caution: the oil will be hot. Keep draining until the flow of oil has slowed to a drip.
- o Replace the drain plug. Wipe up any drips.

◆ **STEP 2: Carefully transfer the used motor oil.**

- o If not using a drain pan that serves as both a collection and holding container, use a funnel to pour the used motor oil into a clean, leak-proof container with a tight-fitting lid.
- o Containers specifically designed to hold used motor oil can be purchased at a local automotive supply store. In addition, certain everyday household containers (e.g., milk jugs) or the original oil bottles can be used.

- o Don't put used motor oil in containers that held chemicals like bleach, pesticides, paint or antifreeze – they can contain residues that contaminate the used motor oil.
- o Seal the container and label it as "Used Motor Oil."

◆ **STEP 3: Drain the oil filter.**

- o Remove the used oil filter.
- o Drain the used oil filter hole-side down into a container to collect the used motor oil for recycling. Allow the filter to drain overnight or for at least 12 hours to remove the used motor oil.
- o Place the old filter in a leak-proof container (coffee can with lid or resealable plastic bag). The used oil filter may contain 2 to 8 ounces of used motor oil even when drained.
- o Replace the used oil filter with a new one.

◆ **STEP 4: Take your used oil, oil filters and bottles to a recycling location.** There are more than 800 recycling locations for used motor oil throughout South Carolina including locations in each of the state's 46 counties.

For more information on where to recycle used motor oil, filters and bottles visit www.scdhec.gov/environment/lwm/recycle/counties.htm or call the Office at 1-800-768-7348.

What CAN and CAN NOT go into a used motor oil collection tank?

The following petroleum products are ACCEPTABLE in used motor oil collection tanks:

- ◆ motor oil;
- ◆ heating oil;
- ◆ automatic transmission fluid;
- ◆ gear oil;
- ◆ diesel fuel;
- ◆ power steering fluid;
- ◆ fuel oil;
- ◆ kerosene; and
- ◆ hydraulic fluid.

The following liquids are NOT ACCEPTABLE in used motor oil collection tanks:

- ◆ water;
- ◆ refrigeration oil;
- ◆ gasoline;
- ◆ brake fluid;
- ◆ paint thinner/Varsol;
- ◆ any solvent or cleaner;
- ◆ antifreeze; nor
- ◆ any substance used to clean paint brushes.

LESSON RESOURCE



USED MOTOR OIL FACTS & FIGURES

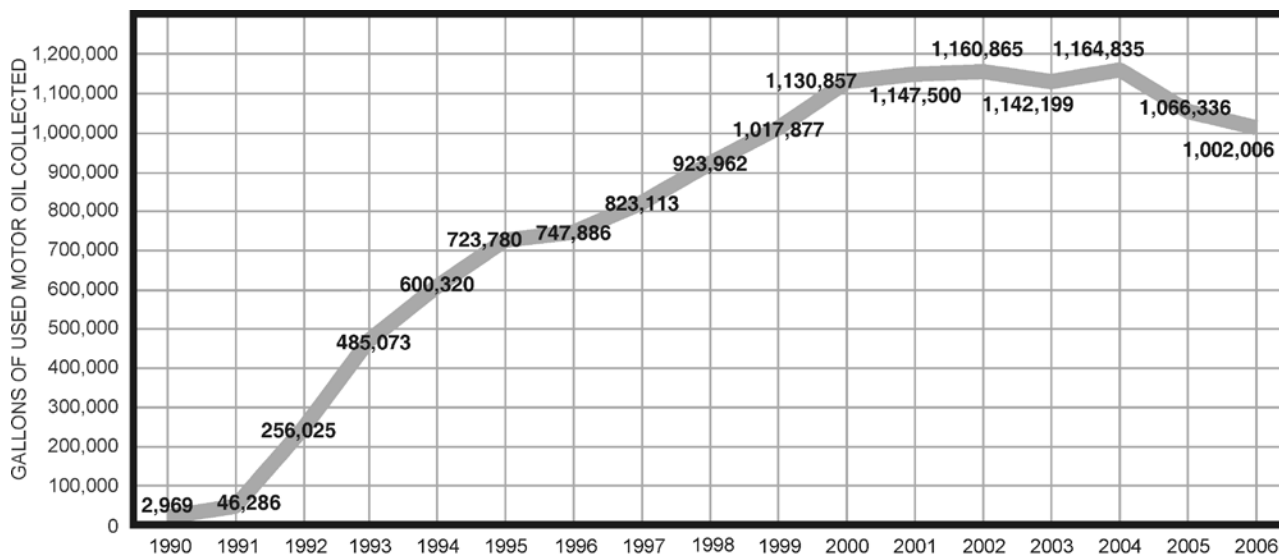
The S.C. Solid Waste Policy and Management Act of 1991 (Act) requires the S.C. Department of Health and Environmental Control's (DHEC) Office of Solid Waste Reduction and Recycling (Office) to annually compile a report on the state's used motor oil recycling program for do-it-yourself oil changers (DIYers). According to the Act, the report must include: 1) the amount of used motor oil collected in each county; 2) the number of used motor oil collection sites available in each county; and 3) a summary of local government programs receiving grant funding from the Office.

The Act requires that operators of used oil collection sites must report to DHEC the amount of used motor oil collected each calendar year. Grant funding and the solid waste data in this publication are reported by fiscal year. For purposes of this report, however, the amount of used motor oil collected is presented in two ways: 1) by calendar year 2006; and 2) by fiscal year (FY) 2007 (July 1, 2006 to June 30, 2007).

For the eighth consecutive calendar year, more than 1 million gallons of used motor oil were collected for recycling. In 2006, DIYers recycled 1,002,006 gallons of used motor oil. For this report, only used motor oil generated and recycled by DIYers is counted as part of the state's MSW recycling rate. Chart 4.1 illustrates the growth of the used motor oil collection program for DIYers (by calendar year) while Table 4.2 lists the amount of used motor oil collected in each county in FY07. The 978,280 gallons of used motor oil collected in FY07 equates to 3,522 tons.

Annual collection data for DIY used motor oil recycling seems to indicate a plateau of slightly more than 1 million gallons as seen in Chart 4.1. This leveling off may be attributed to several factors including: 1) U.S. Department of Energy reports that the DIY population decreased from 60 to 45 percent between 1995 and 2004; 2) many local governments use DIY used motor oil in waste oil heaters and may not track or report that volume; and 3) frequency

Used Motor Oil Collection Figures for Calendar Year 2006*



* **NOTE:** Used motor oil recycling sites are required by law to be registered with the state. Collection figures were taken from reports compiled by DHEC's Office of Solid Waste Reduction and Recycling. Figures for calendar year 2007 were not available when this document was printed.

of DIY oil changes may be decreasing due to the economy, use of synthetic motor oil and new manufacturer recommendations.

The program for DIYers – primarily funded by DHEC through the Used Oil Trust Fund – has grown to more than 800 collection sites across the state. Part of this growth can be attributed to retail outlets, quick lubes and auto parts stores that accept used motor oil from DIYers in addition to local government collection sites. Table 4.2 provides a breakdown of the number of used motor oil collection sites for DIYers by county.

In addition to used motor oil, most county recycling programs also collect used motor oil filters and motor oil bottles from DIYers. The amounts of used motor oil filters and motor oil bottles recycled are not available as many counties collect and market filters

with other metals and bottles with other HDPE plastic bottles and jugs.

Overall, there are few barriers to recycling used motor oil, used motor oil filters and motor oil bottles. Markets are not an issue. The S.C. Budget and Control Board has developed a state-term contract to assist local governments and others in marketing used motor oil and used motor oil filters. In fact, the state-term contract vendor for used motor oil collection and recycling pays contract users 49 cents per gallon of used motor oil collected. Other markets for used motor oil recycling – including Santee Cooper – are available as well. Bottles, if properly drained, can be recycled with other HDPE plastic. In addition to the state-term contract, local scrap dealers and steel mills accept drained/crushed used oil filters for recycling.

| Number of DIY Used Motor Oil Collection Sites, FY07 Grant Funding Awarded for DIY Used Motor Oil Recycling Programs and DIY Used Motor Oil Recycled by County | | | | | |
|---|-------------------------------|----------------------|-------------------------|-------------------------------|----------------------|
| COUNTY/ MUNICIPALITY | NUMBER OF COLLECTION SITES | GALLONS COLLECTED | COUNTY/ MUNICIPALITY | NUMBER OF COLLECTION SITES | GALLONS COLLECTED |
| Abbeville | 12 | 6,389 | Horry | 37 | 49,167 |
| Aiken | 25 | 46,389 | Jasper | 6 | 7,222 |
| ■ City of N. Augusta | — | — | Kershaw | 15 | 23,889 |
| Allendale | 6 | 2,500 | Lancaster | 15 | 17,500 |
| Anderson | 27 | 33,889 | Laurens | 12 | 13,333 |
| Bamberg | 10 | 4,167 | Lee | 9 | 11,111 |
| Barnwell | 14 | 10,000 | Lexington | 25 | 99,444 |
| Beaufort | 17 | 26,111 | Marion | 10 | 5,555 |
| Berkeley | 17 | 46,944 | Marlboro | 17 | 2,500 |
| Calhoun | 10 | 8,056 | McCormick | 4 | 2,778 |
| Charleston | 22 | 41,111 | Newberry | 16 | 11,667 |
| Cherokee | 17 | 5,278 | Oconee | 23 | 18,333 |
| Chester | 15 | 10,556 | ■ City of Seneca | — | — |
| Chesterfield | 10 | 7,500 | Orangeburg | 29 | 24,167 |
| Clarendon | 19 | 13,333 | Pickens | 18 | 34,444 |
| Colleton | 21 | 11,944 | ■ City of Easley | — | — |
| Darlington | 17 | 11,667 | Richland | 24 | 31,389 |
| Dillon | 14 | 8,056 | Saluda | 9 | 8,211 |
| Dorchester | 19 | 37,222 | Spartanburg | 38 | 50,833 |
| Edgefield | 10 | 10,278 | Sumter | 21 | 25,556 |
| Fairfield | 12 | 9,167 | ■ City of Sumter | — | — |
| Florence | 28 | 27,500 | Three Rivers SWA* | — | — |
| Georgetown | 20 | 20,000 | Tri-County SWA** | — | — |
| Greenville | 41 | 59,514 | Union | 11 | 4,722 |
| ■ City of Greenville | — | — | Williamsburg | 25 | 12,222 |
| Greenwood | 14 | 14,167 | York | 34 | 46,388 |
| Hampton | 12 | 6,111 | ■ City of Rock Hill | — | — |
| | | | STATE TOTAL | 827 | 978,280 |

* The Three Rivers Solid Waste Authority provides solid waste management services to local governments in Aiken, Allendale, Bamberg, Barnwell, Calhoun, Edgefield, McCormick, Orangeburg and Saluda counties.

** The Tri-County Solid Waste Authority (SWA) provides solid waste management services to local governments in Edgefield, McCormick and Saluda counties.

ACTIVITY PAGE



PUZZLE 1: WORD FILL

Word Bank

Use the words below to complete the sentences on the right.

BANNED

DO-IT-YOURSELFERS

ENERGY

LAW

RECYCLED

USED MOTOR OIL

**USED MOTOR OIL
FILTERS AND BOTTLES**

Many of us ride in cars and other vehicles every day. In order to keep these vehicles running properly, the oil must be changed several times a year.

In South Carolina, used motor oil is _____ from landfills and cannot be disposed of in sewers, drainage systems, septic tanks, surface water or groundwater and on the ground. Used motor oil must be _____.

If you know someone that changes their motor oil themselves, they are considered _____ and are responsible for recycling their _____.

There are more than 800 collection sites around the state that accept used motor oil from do-it-yourselfers. These sites also may accept _____.

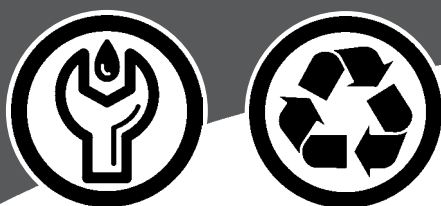
Recycling used motor oil saves _____ and reduces our need to import oil.

In South Carolina, recycling used motor oil is easy. It is the right thing to do. It also is the _____.

The "Take Action: Recycle Used Motor Oil Tool Kit" is a part of "Action for a cleaner tomorrow: A South Carolina Environmental Curriculum Supplement" ("Action") provided by the S.C. Department of Health and Environmental Control's Office of Solid Waste Reduction and Recycling.

To learn more about "Action," call 1-800-768-7348 or visit www.scdhec.gov/environment/lwm/recycle/education.htm.

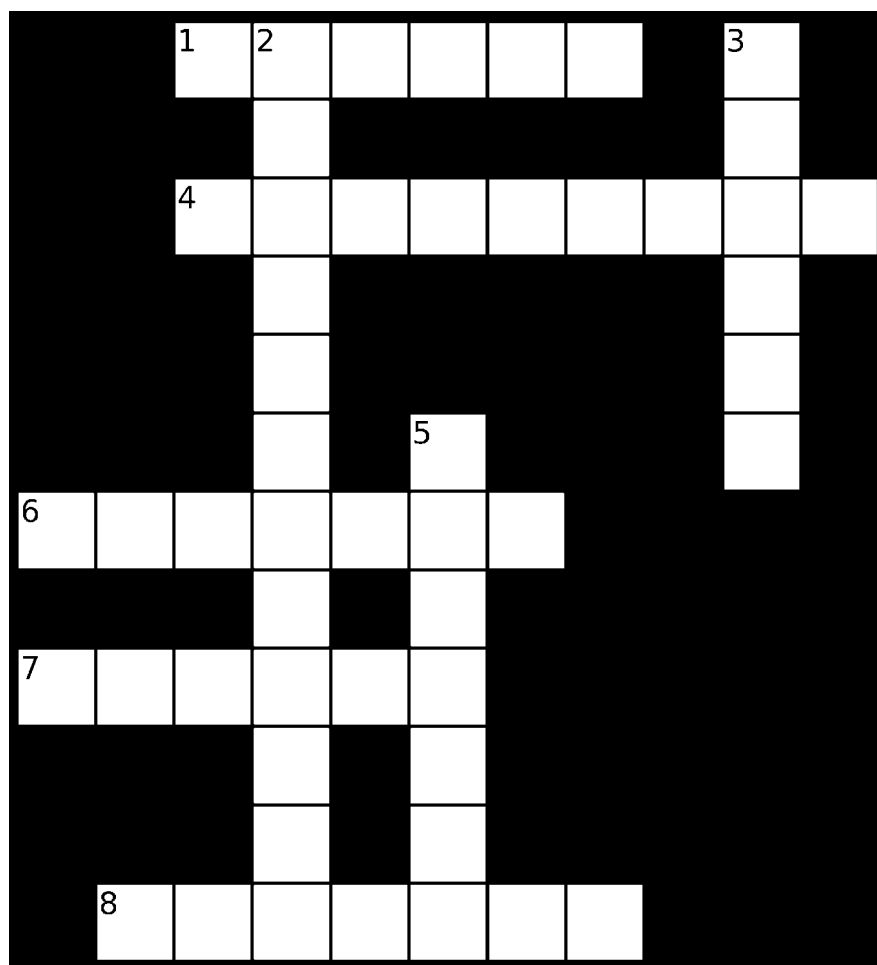
ACTIVITY PAGE



PUZZLE 2: CROSSWORD

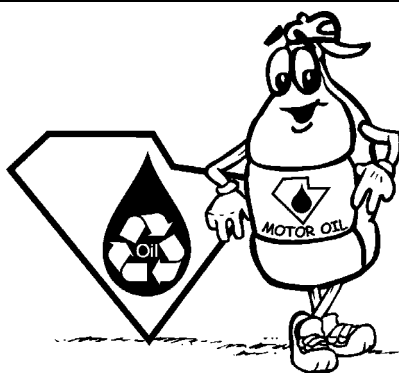
Across

- 1 There are more than 800 used motor oil collection sites for the _____.
- 4 _____ motor oil is the law in South Carolina.
- 6 Recycle used motor oil filters and oil _____ in addition to used motor oil.
- 7 Recycling used motor oil saves valuable _____.
- 8 Protect the environment by taking your used motor oil and oil _____ to your nearest public oil collection center.



Down

- 2 _____ has been used in an engine and must be recycled in South Carolina.
- 3 Disposal of motor oil in landfills is _____ in South Carolina.
- 5 When you _____ used motor oil it protects human health and the environment.



Word Bank

| | |
|---------|-----------|
| BANNED | RECYCLE |
| BOTTLES | RECYCLING |
| ENERGY | USED |
| FILTERS | MOTOR OIL |
| PUBLIC | |

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ACTIVITY PAGE

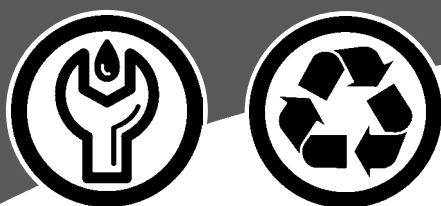


PUZZLE 3: WORD FIND

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| T | R | L | R | E | E | O | R | T | I |
| N | R | E | Y | L | N | I | O | N | L |
| E | E | I | U | E | N | E | P | N | E |
| M | T | N | T | S | S | L | R | M | T |
| N | L | I | Y | B | E | R | O | G | M |
| O | I | L | B | O | T | T | L | E | Y |
| R | F | O | T | L | O | E | O | N | L |
| I | L | M | B | R | O | T | I | N | R |
| V | I | M | O | H | U | S | A | N | M |
| N | O | I | T | U | L | L | O | P | I |
| E | L | C | Y | C | E | R | I | V | I |

Find these words: motor oil; environment; pollution; recycle; reuse; oil filter; oil bottle; and energy.

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ACTIVITY PAGE ANSWERS

Puzzle 1: Word Fill

Many of us ride in cars and other vehicles every day. In order to keep these vehicles running properly, the oil must be changed several times a year.

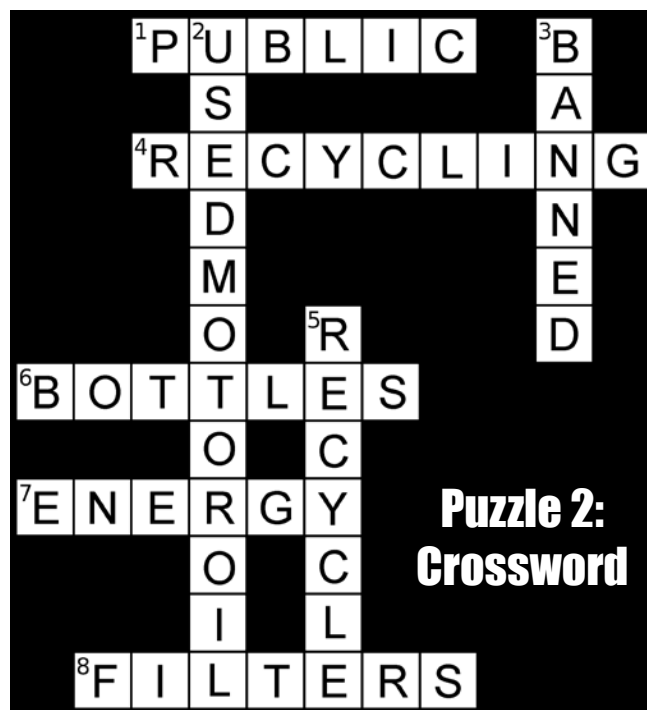
In South Carolina, used motor oil is **BANNED** from landfills and cannot be disposed of in sewers, drainage systems, septic tanks, surface water or groundwater and on the ground. Used motor oil must be **RECYCLED**.

If you know someone that changes their motor oil themselves, they are considered **DO-IT-YOURSELFERS** and are responsible for recycling their **USED MOTOR OIL**.

There are more than 800 collection sites around the state that accept used motor oil from do-it-yourselfers. These sites also may accept **USED MOTOR OIL FILTERS AND BOTTLES**.

Recycling used motor oil saves **ENERGY** and reduces our need to import oil.

In South Carolina, recycling used motor oil is easy. It is the right thing to do. It also is the **LAW**.



Puzzle 2: Crossword

Puzzle 3: Word Find

